## AMENDMENTS TO THE CLAIMS

### Listing of the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of affecting chronic pain in a patient in need thereof comprising:

implanting a stimulator in a target site of the brain;

exposing the patient to a first stimulus that elicits pain;

measuring the patient's threshold for pain during the first stimulus;

~~detecting a bodily activity of the body associated with the chronic pain; and~~

~~providing~~ then administering a stimulation signal to the stimulator ~~in response to the detected bodily activity~~ to stimulate the target site; ~~to affect chronic pain in the patient, the stimulation signal having the following parameters:~~

~~a voltage between about 1V to about 15V;~~

~~a frequency between about 2 Hz and 2500Hz; and~~

~~a pulse width between about 10 microseconds to about 1,000 microseconds,~~

exposing the patient to a second stimulus that elicits pain;

re-measuring the patient's threshold for pain during the second stimulus and during administration of the stimulation signal; and

adjusting the stimulation signal if necessary in response to the re-measurement of the patient's threshold for pain,

wherein the target site is selected from the group consisting of the pre-frontal cortex, orbitofrontal cortex, anterior limb of the internal capsule, insular cortex, secondary somatosensory cortex, cingulate cortex, anterior cingulate cortex, posterior cingulate cortex, inferior frontal gyrus, middle frontal gyrus, superior frontal gyrus, medial frontal gyrus, parahippocampal gyrus, precuneus, amygdala, and hippocampus.

2. (Original) The method of claim 1, wherein the target site is the pre-frontal cortex.

3. (Original) The method of claim 1, wherein the target site is the orbitofrontal cortex.

4. (Original) The method of claim 1, wherein the target site is the anterior limb of the internal capsule.

5. (Original) The method of claim 1, wherein the target site is the insular cortex.

6. (Cancelled)

7. (Currently Amended) The method of claim 1, wherein the target site is the secondary ~~seconary~~ somatosensory cortex.

8. (Original) The method of claim 1, wherein the target site is the cingulate cortex.

9. (Original) The method of claim 1, wherein the target site is the anterior cingulate cortex.

10. (Original) The method of claim 1, wherein the target site is the posterior cingulate cortex.

11. (Original) The method of claim 1, wherein the target site is the inferior frontal gyrus.

12. (Original) The method of claim 1, wherein the target site is the middle frontal gyrus.

13. (Original) The method of claim 1, wherein the target site is the superior frontal gyrus.

14. (Original) The method of claim 1, wherein the target site is the medial frontal gyrus.

15. (Original) The method of claim 1, wherein the target site is the parahippocampal gyrus.

16. (Original) The method of claim 1, wherein the target site is the precuneus.

17. (Original) The method of claim 1, wherein the target site is the amygdala.

18. (Original) The method of claim 1, wherein the target site is the hippocampus.

19. (Currently Amended) A method of affecting chronic pain in a patient in need thereof comprising:

implanting a stimulator in a target site of the brain;

exposing the patient to a first stimulus that elicits pain;

measuring the patient's threshold for pain during the first stimulus;

~~detecting a bodily activity of the body associated with the chronic pain; and~~

~~providing~~ then administering a stimulation signal to the stimulator ~~in response to the detected bodily activity~~ to stimulate the target site~~; to affect chronic pain in the patient~~, ~~the stimulation signal having the following parameters:~~

~~a voltage between about 1V to about 15V;~~

~~a frequency between about 2 Hz and 2500Hz; and~~

~~a pulse width between about 10 microseconds to about 1,000 microseconds,~~

exposing the patient to a second stimulus that elicits pain;

re-measuring the patient's threshold for pain during the second stimulus and during administration of the stimulation signal; and

adjusting the stimulation signal if necessary in response to the re-measurement of the patient's threshold for pain,

wherein the target site is selected from the group consisting the anterior nucleus of the thalamus, mammillary body, lateral hypothalamus, locus coeruleus, dorsal raphe nucleus, substantia nigra pars compacta, substantia nigral pars reticulata, superior colliculus, tegmentum, ventral tegmentum, tectum, medial thalamus, nucleus accumbens, ventral striatum, and ventral pallidum.

20. (Original) The method of claim 19, wherein the target site is the anterior nucleus of the thalamus.

21-22. (Cancelled)

23. (Original) The method of claim 19, wherein the target site is the mammillary body.

24. (Original) The method of claim 19, wherein the target site is the lateral hypothalamus.

25. (Original) The method of claim 19, wherein the target site is the locus coeruleus.

26. (Original) The method of claim 19, wherein the target site is the dorsal raphe nucleus.

27. (Original) The method of claim 19, wherein the target site is the substantia nigra pars compacta.

28. (Original) The method of claim 19, wherein the target site is the substantia nigra pars reticulata

29. (Original) The method of claim 19, wherein the target site is the superior colliculus.

30. (Original) The method of claim 19, wherein the target site is the tegmentum.

31. (Original) The method of claim 19, wherein the target site is the ventral tegmentum.

32. (Original) The method of claim 19, wherein the target site is the tectum.

33. (Currently Amended) The method of claim 19, wherein the target site is the ~~ventral~~ medial thalamus.

34. (Original) The method of claim 19, wherein the target site is the nucleus accumbens.

35. (Original) The method of claim 19, wherein the target site is the ventral striatum.

36. (Original) The method of claim 19, wherein the target site is the ventral pallidum

37. (Withdrawn) A method of affecting chronic pain in a patient in need thereof comprising:

a) implanting a stimulator in communication with a pain circuitry target site; and

b) providing a stimulation signal to the stimulator to stimulate the synthesis or release of an endogenous opioid to affect chronic pain in the patient.

38-40. (Cancelled)

41. (Withdrawn) The method of claim 37, wherein the stimulator is implanted in a pain circuitry target site selected from the group consisting of the pre-frontal cortex, orbitofrontal cortex, anterior limb of the internal capsule, insular cortex, primary somatosensory cortex, secondary somatosensory cortex, cingulate cortex, anterior cingulate cortex, posterior cingulate cortex, inferior frontal gyrus, middle frontal gyrus, superior frontal gyrus, medial frontal gyrus, parahippocampal gyrus, precuneus, amygdala, and hippocampus.

42. (Withdrawn) The method of claim 37, wherein the stimulator is implanted in a pain circuitry target site selected from the group consisting of the anterior nucleus of the thalamus, intralaminar thalamic nuclei, dorsomedial nucleus of the thalamus, mammillary body, lateral hypothalamus, locus coeruleus, dorsal raphe nucleus, substantia nigra pars compacta, substantia nigral pars reticulata, superior colliculus, tegmentum, ventral tegmentum, tectum, medial thalamus, nucleus accumbens, ventral striatum, and ventral pallidum.

43. (New) The method of claim 1, wherein the first stimulus and the second stimulus are the same stimulus.

44. (New) The method of claim 1, wherein the first stimulus and the second stimulus are different stimuli.

45. (New) The method of claim 19, wherein the first stimulus and the second stimulus are the same stimulus.

46. (New) The method of claim 19, wherein the first stimulus and the second stimulus are different stimuli.

47. (New) The method of claim 1, wherein the first stimulus and/or second stimulus is a tactile stimulus.

48. (New) The method of claim 1, wherein the first stimulus and/or the second stimulus is a noxious stimulus.

49. (New) The method of claim 1, wherein the first stimulus and/or second stimulus is an increase or decrease in temperature.

50. (New) The method of claim 19, wherein the first stimulus and/or second stimulus is a tactile stimulus.

51. (New) The method of claim 19, wherein the first stimulus and/or the second stimulus is a noxious stimulus.

52. (New) The method of claim 19, wherein the first stimulus and/or second stimulus is an increase or decrease in temperature.